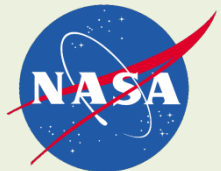


**NASA Science Mission Directorate
Earth Science Division
Applied Sciences Program**



Water Resources Program Review

September 5-6, 2012



Goal for the next 2 days



- ***Review of Current Projects***
- ***Discuss Program requirements and resources***
- ***Identify Opportunities and Challenges***
 - ✓ ***FY2013 Implementation Plan***
 - ✓ ***FY2014-2018 Strategic Plan***

Water Resources Application Area

Associate Program Managers



Karen Mohr, Research Meteorologist, NASA-Goddard
Space Flight Center

Numerical modeling and observation of land/atmosphere interaction, convective initiation, and organized convective systems using surface, upper air, remote sensing (radar, visible/IR, passive microwave), and reanalysis data and GIS. Special emphasis on the surface hydrology, weather, and short-term climate of semi-arid regions (e.g., Southern Great Plains, West Africa).

Water Resources Application Area

Associate Program Managers



Forrest Melton, Sr. Research Scientist, California State University Monterey Bay – NASA Ames Research Center Cooperative

Since 2003, Forrest has worked in the Ecological Forecasting Lab at NASA Ames Research Center on the development of the Terrestrial Observation and Prediction System (TOPS) and the NASA Earth Exchange (NEX). His research interests include ecosystem and carbon cycle modeling, and applications of satellite data and ecosystem models to improve management of natural resources. Forrest holds B.S. and M.S. degrees in Earth Systems Science from Stanford University, and has co-authored more than twenty papers and book chapters on applications of remote sensing.

Roles and Responsibilities



HQ – Program Managers

- Budget Planning and Current-Year Phasing
- Decisions on Project selection, including funding approval
- Decisions on Project renewals and augmentations, including funding
- Grant/award (project) processing - procurement processing (i.e., RAPTOR)

Associates

- Input to budget planning
- Routine contact with PIs for project status
- Project tracking - fund receipt verification, reports, project costing
- Recommendations to PMs on project renewals (or modifications, cancellations)

Note: Discussions with resource analyst can aid Associates regarding obligations and costing on individual projects

A.34: Key Statistics: Recommended Proposals

Start Date ~ 1 June 2012

Down Select ~ 29 May 2013??

Key Issues:

- Minimize time from Final Report to Downselect Start crucial
 - SC approval of Downselect process needed prior to next May
- Standardize Reporting

PI Last name	Title	Proposing Organization
VERDIN	Fallowed Area Mapping for Drought Impact Reporting and Decision Making	GEOLOGICAL SURVEY US DEPT
PAINTER	Integration of precision NASA snow products with the operations of the Colorado Basin River Forecast Center to improve decision making under drought conditions	CALIFORNIA INSTITUTE OF TECHNOLOGY
HAIN	Development of a Multi-Scale Remote Sensing Based Framework for Mapping Drought over North America	UNIVERSITY OF MARYLAND
JUDGE	Integration of remote sensing observations and a web-based decision support system for managing impacts of agricultural droughts on crop yields in heterogeneous landscapes	UNIVERSITY OF FLORIDA
BIRKETT	The Global Reservoir and Lake Monitor (GRLM): Expansion and Enhancement of Water Height Products.	UNIVERSITY OF MARYLAND
MELTON	Mitigation of Drought Impacts on Agriculture through Satellite Irrigation Monitoring and Management Support	NASA AMES RESEARCH CENTER
VIVONI	Cloud Computing-based Delivery of Drought Information at Multiple Scales	ARIZONA STATE UNIVERSITY
JUSTICE	Global monitoring of agricultural drought: A contribution to GEO GLAM	UNIVERSITY OF MARYLAND
DOZIER	Assessing Water Resources in Remote, Sparsely Gauged, Snow-Dominated Mountain Basins	UC, SANTA BARBARA
KRAKAUER	Application of Evapotranspiration and Soil Moisture Remote Sensing Products to Enhance Hydrological Modeling for Decision Support in the New York City Water Supply	RFCUNY - CITY COLLEGE
ROSENZWEIG	Adaptation Planning for Climate Change Impacts using Advanced Decision Support and Remote Sensing: Irrigated Agriculture in California's Central Valley	NASA/GODDARD SPACE FLIGHT CENTER
MARGULIS	Investigating the Feasibility of Incorporating Remote Sensing and Earth Science Datasets into Existing Frameworks for Improving Water Supply and Drought Forecasts in California	UC, LOS ANGELES
Wardlow	The Quick Drought Response Index (QuickDRI): An Integrated Approach for Rapid Response Agricultural Drought Monitoring	UNIVERSITY OF NEBRASKA, LINCOLN

.....with Stakeholders



PI Last name	Title	Proposing Organization	Stakeholder Organization
VERDIN	Fallowed Area Mapping for Drought Impact Reporting and Decision Making	GEOLOGICAL SURVEY US DEPT	NATIONAL INTERAGENCY DROUGHT INFORMATION SYSTEM (NIDIS)
PAINTER	Integration of precision NASA snow products with the operations of the Colorado Basin River Forecast Center to improve decision making under drought conditions	CALIFORNIA INSTITUTE OF TECHNOLOGY	COLORADO RIVER BASIN FORECAST CENTER
HAIN	Development of a Multi-Scale Remote Sensing Based Framework for Mapping Drought over North America	UNIVERSITY OF MARYLAND	UNITED STATES DROUGHT MONITOR (USDM)
JUDGE	Integration of remote sensing observations and a web-based decision support system for managing impacts of agricultural droughts on crop yields in heterogeneous landscapes	UNIVERSITY OF FLORIDA	PRIVATE SECTOR
BIRKETT	The Global Reservoir and Lake Monitor (GRLM): Expansion and Enhancement of Water Height Products.	UNIVERSITY OF MARYLAND	U.S. DEPARTMENT OF AGRICULTURE
MELTON	Mitigation of Drought Impacts on Agriculture through Satellite Irrigation Monitoring and Management Support	NASA AMES RESEARCH CENTER	WESTERN GROWERS ASSOCIATION, CA DWR
VIVONI	Cloud Computing-based Delivery of Drought Information at Multiple Scales	ARIZONA STATE UNIVERSITY	DEPARTMENT OF STATE
JUSTICE	Global monitoring of agricultural drought: A contribution to GEO GLAM	UNIVERSITY OF MARYLAND	U.S. DEPARTMENT OF AGRICULTURE
DOZIER	Assessing Water Resources in Remote, Sparsely Gauged, Snow-Dominated Mountain Basins	UC, SANTA BARBARA	US CORPS OF ENGINEERS
KRAKAUER	Application of Evapotranspiration and Soil Moisture Remote Sensing Products to Enhance Hydrological Modeling for Decision Support in the New York City Water Supply	RFCUNY - CITY COLLEGE	NEW YORK CITY
ROSENZWEIG	Adaptation Planning for Climate Change Impacts using Advanced Decision Support and Remote Sensing: Irrigated Agriculture in California's Central Valley	NASA/GODDARD SPACE FLIGHT CENTER	U.S. BUREAU OF RECLAMATION
MARGULIS	Investigating the Feasibility of Incorporating Remote Sensing and Earth Science Datasets into Existing Frameworks for Improving Water Supply and Drought Forecasts in California	UC, LOS ANGELES	LOS ANGELES, CA
WARDLOW		UNIVERSITY OF NEBRASKA, LINCOLN	U.S. DROUGHT MONITOR

Project Portfolio

Solicitation Name	NASA Proposal Number	PI LastName	PI FirstName	Title	Associate
Decisions 2007	07-DEC07-0047	Cai	Ximing	Developing Seasonal Predictive Capability for Drought Mitigation Decision Support System	N/A
Decisions 2007	07-DEC07-0099	Cline	Don	Benchmarking NASA Snow Research Results in NWS Hydrological Decision Support	Mohr
Decisions 2008	08-DEC08-0027	Lehrter	John C	Satellite Earth Image Products Applied to Development of Regulatory Water Quality Standards	Mohr
Decisions 2008	08-DEC08-0101	Macauley	Molly K	Improving Water Quality Management: Use of Earth Observations in SPARROW	Mohr
Decisions 2008	08-DEC08-0135	Sorooshian	Soroosh	Enhancing California's Water Resource Management and Decision Support System to Address Impacts of Climate Change	Melton
Decisions 2008	08-DEC08-0070	Verdin	James	A Land Data Assimilation System for Famine Early Warning	Melton
Decisions 2008	08-DEC08-0053	Zaitchik	Benjamin F	Project Nile: Distributed hydrological information for water management in the Nile basin	Mohr
Feasibility 2008	08-FEAS08-0069	Shrestha	Roshan K	A Proto-type Land Surface OSSE Testbed for Obtaining High Resolution Soil Moisture Data for Decision Support Needs	N/A
Feasibility 2008	08-FEAS08-0044	Spiering	Bruce A	Estuary Variance Map for In Situ Sample Station Placement	N/A
Decisions 2007	07-DEC07-0029	Birkett	Charon	The Global Reservoir and Lake Monitoring System: Enhancing the USDA/FAS DSS with NASA, NRL and ESA Satellite Radar Altimeter Data	Mohr
Decisions 2007	07-DEC07-0023	Hansen	Matthew C	Integrating MODIS crop characterization capabilities with AWiFS and agricultural survey data to improve the accuracy and timeliness of national crop acreage forecasts provided by the USDA NASS Croplan	N/A
Decisions 2008	08-DEC08-0025	Crow	Wade T	Enhancing the USDA Global Crop Production Decision Support System with NASA Land Information System and Water Cycle Satellite Observations	Mohr
Decisions 2008	08-DEC08-0026	Daughtry	Craig S. T.	Impacts of Biofuel Development on Carbon Management and Agricultural Conservation Practices	N/A
Decisions 2008	08-DEC08-0094	Di	Liping	A national crop progress system based on NASA Earth science results	N/A

Project Portfolio (2)

Solicitation Name	NASA Proposal Number	PI LastName	PI FirstName	Title	Associate
Decisions 2008	08-DEC08-0074	Goncalves	Luis G	Integrating NASA Earth Sciences Research results into Decision Support Systems for Agriculture and Water Management in South America	N/A
Decisions 2008	08-DEC08-0120	Hagen	Stephen C	Rangeland Decision Support System: Improving the decision making process at the USDA by incorporating grassland canopy cover estimates derived from MODIS observations and a web-based geospatial data delivery tool	N/A
Decisions 2008	08-DEC08-0093	Rosenzweig	Cynthia	Integration of NASA Models and Missions into Agricultural Decision Support	Mohr
Decisions 2008	08-DEC08-0050	Teng	William	Improving World Agricultural Supply and Demand Estimates by Integrating NASA Water Cycle-Related Data and Technologies into USDA World Agricultural Outlook Board Decision Making Environment	Mohr
Decisions 2008	08-DEC08-0006	Townsend	Philip A.	Improving BASINS/HSPF predictions of nitrogen export to improve TMDL accuracy using NASA imagery	N/A
Directed 2011	11-Directed-GEO	Justice	Chris	The GEO Global Agriculture Monitoring Task: Supporting the GEOSS vision for an Agricultural Monitoring System of Systems	Melton
R&A ROSES 2009	09-LCLUC09-2-0062 ASP	Hansen	Matt	Advancing methods for global crop area estimation	Melton
R&A ROSES 2010	10-CARBON10-0054 - ASP	Goward	Sam	US Forest Disturbance History from Landsat Phase III	N/A
R&A ROSES 2010	10-NPP10-0059	Justice	Chris	Global Agricultural Monitoring: Transitioning NPP VIIRS Observations into the USDA FAS Decision Support System	Melton
Special Activities				WestFAST	Melton
Special Activities				GEO(Water)	Mohr

Note: CMS Projects not listed (Healey, Brown, Macauley, Duran)

Water Resources in the Earth Science Division





The NASA Earth Science Division supports basic and applied research on the Earth system and its processes.

Significant efforts are to characterize and understand Earth system processes and to improve predictions of the Earth system.

In the course of Earth science, NASA pursues innovative and practical applications of Earth observations and new scientific knowledge to improve public and private organizations' decision-making activities.

Technology

Missions

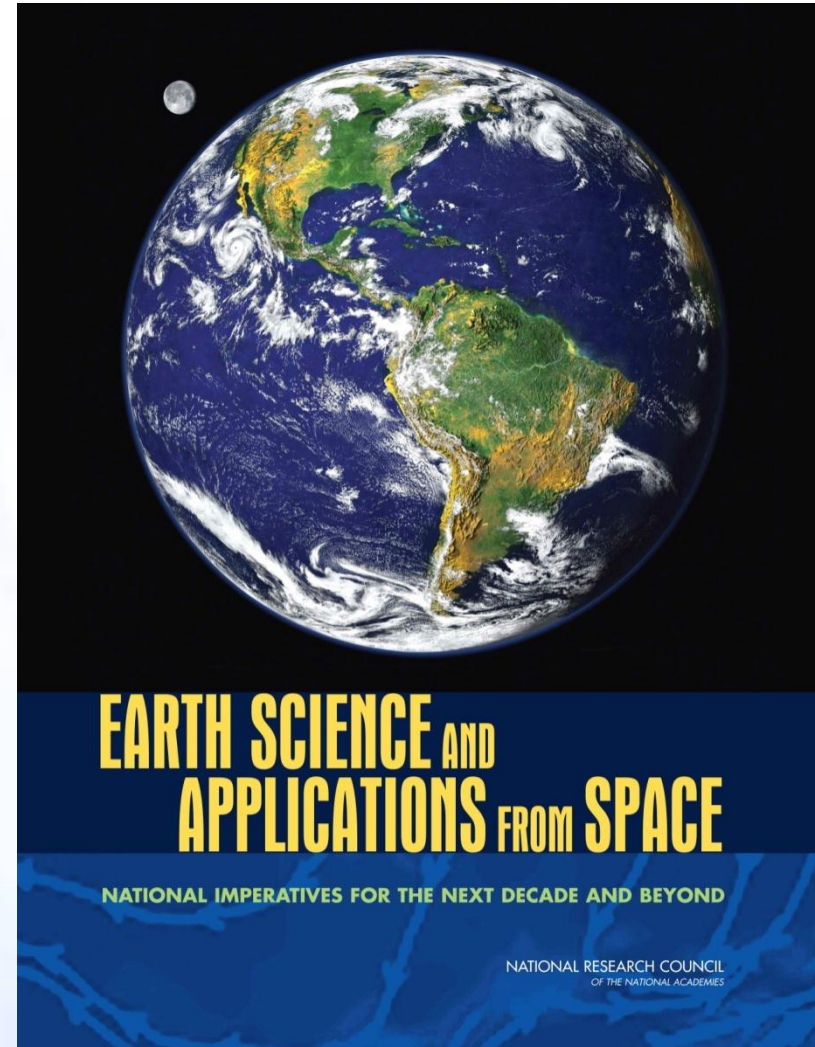
Research

Data Systems

Applications

The national strategy outlined here has as its overarching objective a program of scientific discovery and development of applications that will enhance economic competitiveness, protect life and property, and assist in the stewardship of the planet for this and future generations.

Earth Science Decadal Survey



Strategic Role

Lead efforts in building knowledge and developing abilities within the Nation and world on how to effectively apply Earth observations

Research into and development of applications knowledge – creation of knowledge and understanding of methods and processes for applying Earth science to serve society

- Role encompasses the transition of this applied knowledge to organizations (including the private sector) that can directly apply it to solve societal issues

Applied Sciences Program Goals



Goal 1: Enhance Applications Research

Advance the use of NASA Earth science in policy making, resource management and planning, and disaster response.

Key Actions: Identify priority needs, conduct applied research to generate innovative applications, and support projects that demonstrate uses of NASA Earth science.

Goal 2: Increase Collaboration

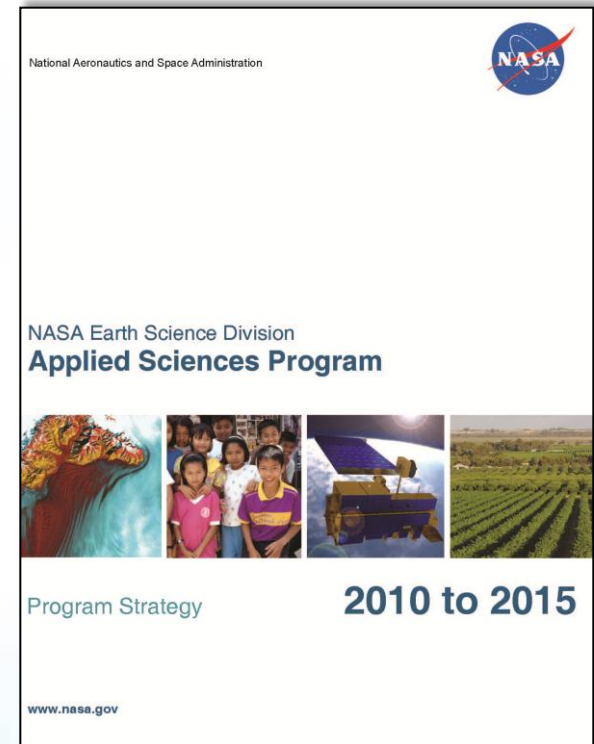
Establish a flexible program structure to meet diverse partner needs and applications objectives.

Key Actions: Pursue partnerships to leverage resources and risks and extend the program's reach and impact.

Goal 3: Accelerate Applications

Ensure that NASA's flight missions plan for and support applications goals in conjunction with their science goals, starting with mission planning and extending through the mission life cycle.

Key Actions: Enable identification of applications early in satellite mission lifecycle and facilitate effective ways to integrate end-user needs into satellite mission planning.



Vision Statement

Public and private organizations routinely and seamlessly integrate Earth observations in their decision making activities and demand additional observation types and Earth science knowledge.



Strategic Functions (in random order)

- Raise expectations for the use of NASA data and models in policy, management, and business and increase demand for NASA Earth science observations and research;
- Advance Earth science research through enabling applications-oriented feedback on observation products, models, and algorithms from the applied community and end users;
- Engage partners and decision-making organizations, inform them of NASA Earth science and represent them within ESD;
- Promote applications to facilitate use of existing products and creation of new products;
- Pioneer innovative methods for public and private organizations to apply Earth science observations to support the U.S. economy and government services;
- Document socioeconomic benefits attributable to Earth observations and build socioeconomic analysis skills within community.

The Applied Sciences Program funds projects that enable uses of NASA Earth science data in organizations' policy, business, and management decisions.

Applications Areas

The program focuses on economic, health, resource management, and other themes to discover and demonstrate applications targeted at integrating Earth observations in specific decision-making activities. Projects with public and private organizations.

- *Applications Projects*
- *Feasibility Studies*
- *Applied Research Teams*
- *Mission Planning Support*

Capacity Building

The program sponsors specific activities to build skills, users, and capabilities in the US and developing countries on how to access and apply environmental satellite data to benefit society.

- *SERVIR*
- *DEVELOP & Workforce development*
- *Gulf of Mexico Initiative*
- *Training Modules*

Applied Sciences Program Approach



The Applied Sciences Program funds projects that enable uses of NASA Earth science data in organizations' policy, business, and management decisions.

Applications Areas

The program focuses on economic, health, resource management, and

***Proving-Out Applications:
Demonstration of
Applications Ideas,
Realization of
Socioeconomic Benefits,
and Transitions***

- Feasibility Studies
- Applied Research Teams
- Mission Planning Support

Capacity Building

The program sponsors specific activities to build skills, users, and

***Building Customers:
Creating Opportunities
for New Users &
Organizations to be
Aware and Able to Use
Earth Science***

- Gulf of Mexico Initiative
- Training Modules



NASA Science Mission Directorate Earth Science Division



Capacity Building Program Water-related Projects

Nancy D. Searby, Ph.D.

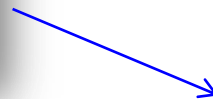


SMD/ESD Applied Sciences Program - Capacity Building



SERVIR Coordination Office (MSFC)
Building international capacity with hubs in

- East Africa
- Hindu Kush - Himalaya
- Mesoamerica



SERVIR
presented
by
Stephanie
Granger



DEVELOP (LaRC national office)
Dual workforce/local government capacity
building using collaborative projects



Gulf of Mexico Initiative, GOMI (SSC)
Building Gulf region's capacity for local issues



Applied Remote SEnsing Training, ARSET (GSFC)
On-line and hands on basic/advanced training to build
domestic skills

Recent Water Resources Project Activity

Fall 2011

- Choptank/Greensboro Watershed Hydrologic Modeling
- Utilizing SAR to Analyze Flood Events in the Central US
- Hydrologic Modeling of Dammed Lakes Sakakawea and Mead

Spring 2012

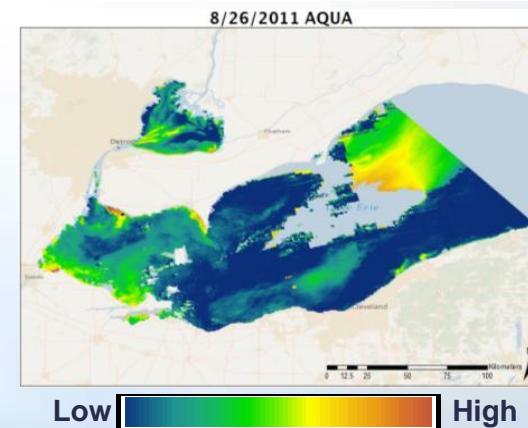
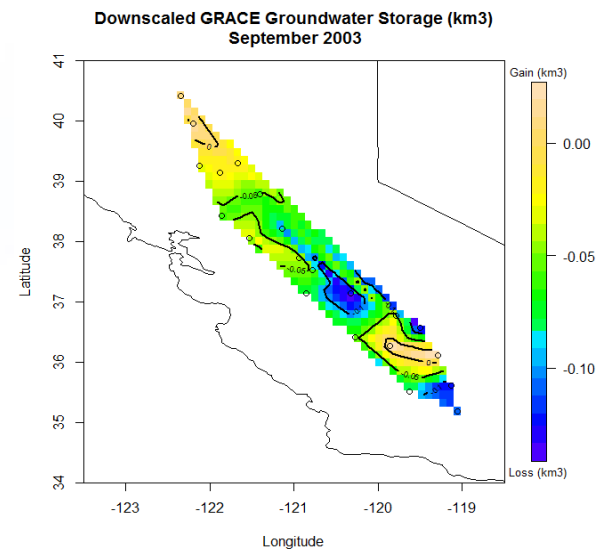
- GRACE Estimates of Groundwater Storage in the Central Valley
- SAR Assessments of Water Extent along Mississippi River Levees
- Early Adoption of Aquarius Data in Coastal Monitoring
- Application of NASA EOS to Mexico City Flood Management
- Ground Water Monitoring in the US-Mexico Border Region Using GRACE
- Monitoring Coastal Pollution Hazards in Southern California with SAR
- Nearshore Stormwater Runoff in the Great Lakes

Summer 2012

- Downscaling GRACE data in the Central Valley Aquifer in California
- Incorporating NASA EOS data into Snowmelt Modeling
- Amazon River Plume Analysis Using Aquarius
- Water Management Tools for the Rio San Juan Watershed in Mexico
- Using TRMM to Better Model Floods for the Upper Missouri Basin
- Enhanced Assessment of Flood Risk in Mexico City

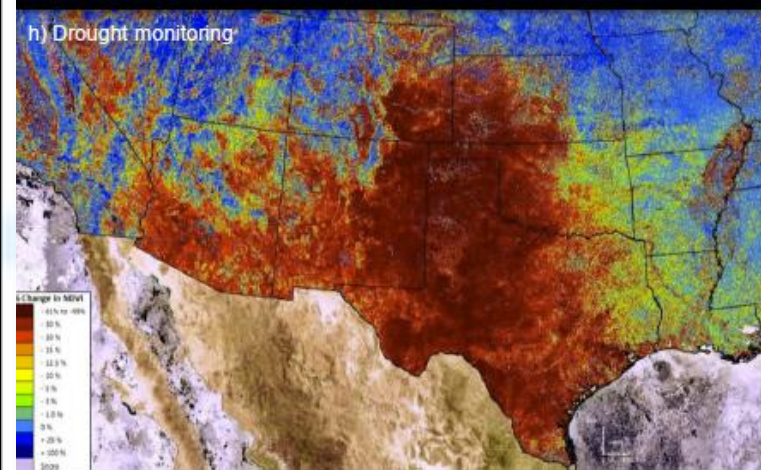
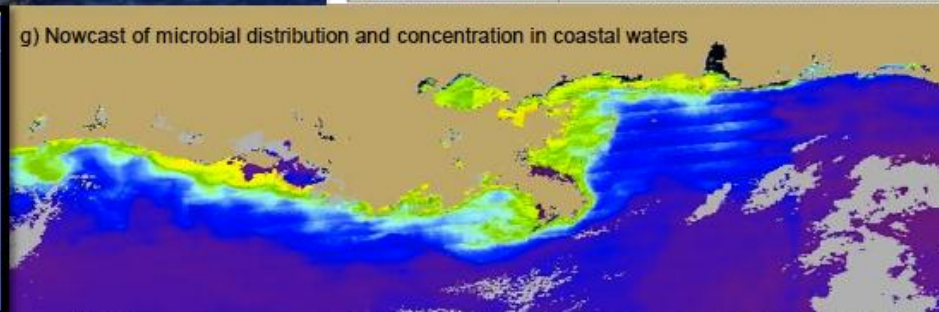
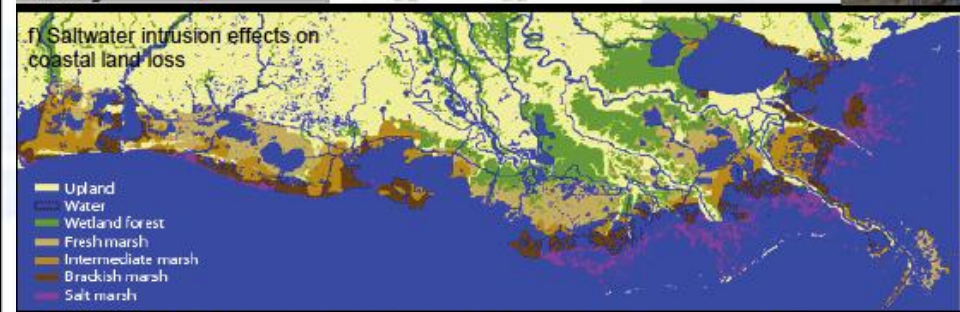
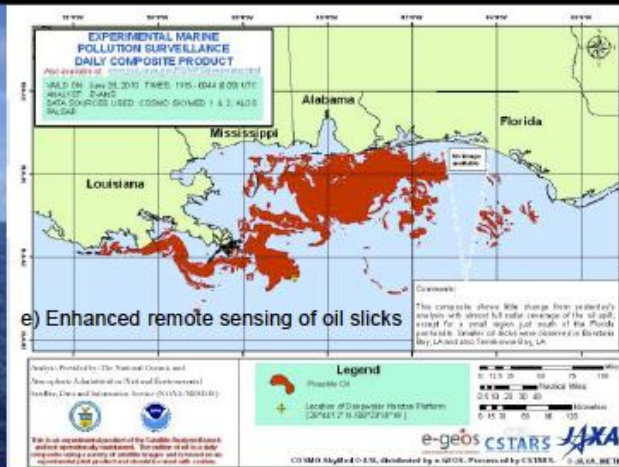
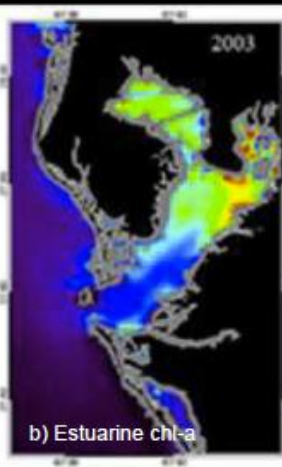
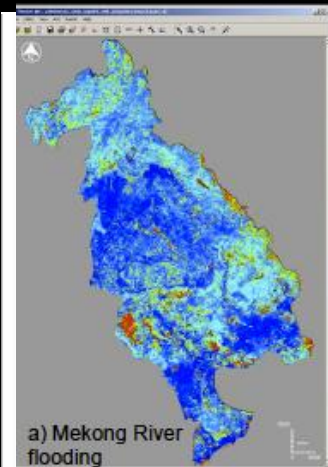
Fall 2012 (Planned)

- MODIS-derived EVT Data for the Upper Missouri River Basin
- Nearshore Stormwater Runoff and Water Quality in the Great Lakes
- Monitoring Water Quality in Southern California with Hyperion and SAR
- Surface Moisture Mapping for the Great Dismal Swamp
- Observing Lake Transparency in Northern Alabama
- Potential Impacts of Urban Development on Big Creek Watershed and Reservoir Water Quality



Total Suspended Solids Concentration

SSC & GOMI FY12 Water Projects





Recent Water Resources Training Activity

- Developed evapotranspiration (ET) training modules: presentations and information from NASA PIs at ARC and GSFC were gathered in preparation for the water resources training in Norman, Oklahoma. These lectures were accompanied by hands-on Case Studies utilizing NASA ET and soil moisture over OK from NLDAS, in conjunction with TRMM precipitation products.
- Water resources basic hands-on training in Norman, Oklahoma on June 19-20, 2012.
 - Key partner agency: National Weather Center, University of Oklahoma. Number of attendees = 24
 - Attendee agencies: Association of Central Oklahoma Governments, Oklahoma Water Resources Board, Oklahoma Department of Environmental Quality, Weathernews America, Chickasaw Nation, Oklahoma Mesonet, Hydros Laboratory (the National Weather Center at the University of Oklahoma), USGS, University of OK, University of OK Center for Spatial Analysis, Langston University (minority university), and Oklahoma State University.
 - Built capacity for flood analysis (TRMM) with model/meteorological data (MERRA) and provided the first ARSET overview presentation on Evapotranspiration products. Course included Case Studies specific to drought and flooding in Oklahoma with use of NLDAS soil moisture products.
- Identified potential training venue at the Colorado Water River Users Association Annual meeting in December 2012. Topics: MODIS snow products and the JPL Snow Data Server.
-
- Snow online course module development on track. Target audience: Colorado and California end-users.
- Researched alternative land and water product visualization tools, e.g. Panoply, HDFViewer,

Status of Other Activities



- CEOS Working Group for Capacity Building and Data Democracy (CEOS WCapD) hosting a flood forecasting workshop incorporating 30 m DEM week of Nov. 5th at RCRMD, Nairobi, Kenya
- Working with US Water Partnership
 - Near-term priorities
 - Water portal (State-funded)
 - Multi-use (water) services (Rockefeller-funded)
 - Water security workshop at State Dep (Skoll Global Threats Fund-funded)

Emphasis in four Applications Areas



**Health &
Air Quality**



**Water
Resources**



Disasters

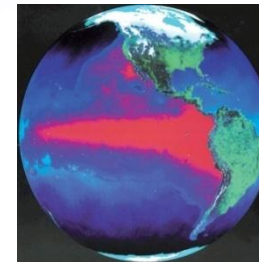


**Ecological
Forecasting**

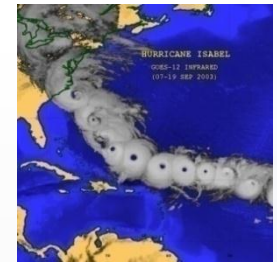
*Seek opportunities to expand to
five additional areas*



Agriculture



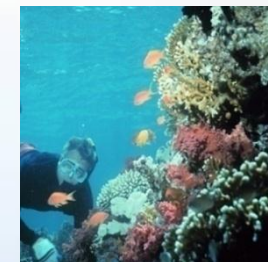
Climate



Weather



Energy



Oceans

Emphasis in four Applications Areas



**Health &
Air Quality**



**Water
Resources**



Disasters



**Ecological
Forecasting**

Formal Applications programs in these areas

Clear, definite goals and investment plans

Distinct Program Manager & Associates

Generating significant applications and transitions as well as in-depth partnerships

Applications that Capacity Building elements can draw on

Applications Areas



Ad hoc, informal activities in these areas

Capacity Building elements can do activities in these areas; however, there won't be as rich an applications base to draw on as in the emphasized Apps Areas

Examples:

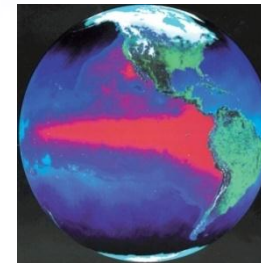
GEO Agriculture Task

National Climate Assessment

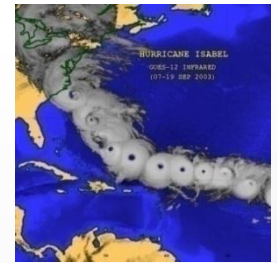
Seek opportunities to expand to five additional areas



Agriculture



Climate



Weather



Energy



Oceans

Emphasis in four Applications Areas

*Seek opportunities to expand to
five additional areas*



Health
Air Quality



Disasters

For all of the Applications Areas, we need to have a ~5-year plan. Plan will be based on market research identifying key needs, and plan will articulate priority activities for ESD/Applied Sciences for the area.

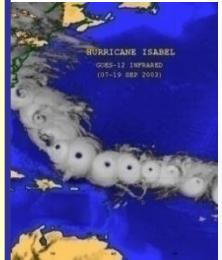
For Emphasized Areas:

- Plan articulates what we will do and when, such as solicitations, to address key needs and priorities

For Additional Areas:

- Plan articulates what we would do if ESD had a application area in this topic

Forecasting



Weather

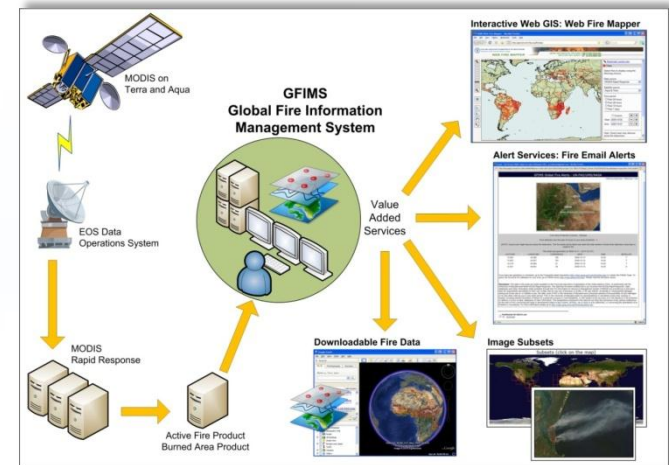


Applications: Project Examples

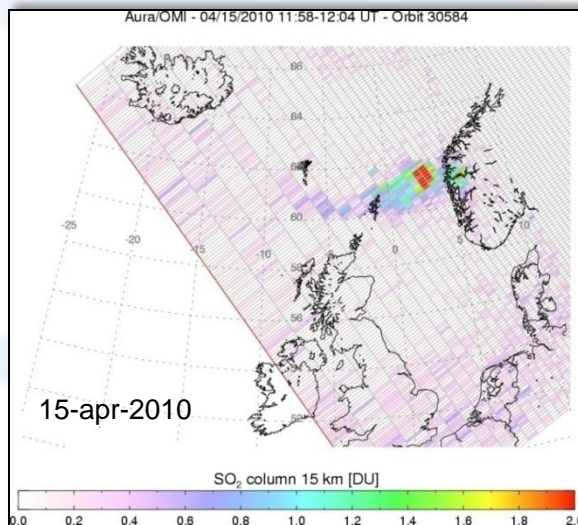


Global active fire locations from MODIS Fire/Thermal Anomalies product are processed in rapid response. SMS/text messages sent out to emails & cell phones with key info (fire coordinates, time, distance to reference point). For example, park managers use alerts to reduce illegal clearing and respond to wildfires.

August 2010: Transitioned to UN FAO for on-going operational support.



System Configuration



OMI SO₂ – Iceland Volcano

Projects developed and demonstrated reliable detection of volcanic ash clouds using Aura/OMI SO₂ data and other NASA Earth science satellite sensors. Proven utility led to its operational use by NOAA to formulate Volcanic Ash Advisories. Products used extensively in Iceland volcano eruption in April 2010.

February 2011: The NASA satellite data were used to produce volcanic ash advisories for aviators across the Gulf of Mexico due to the Feb.1 eruption of the Popocatepetl volcano in Mexico.



Applied Sciences Program

Discovering Innovative & Practical Applications of NASA Earth Science

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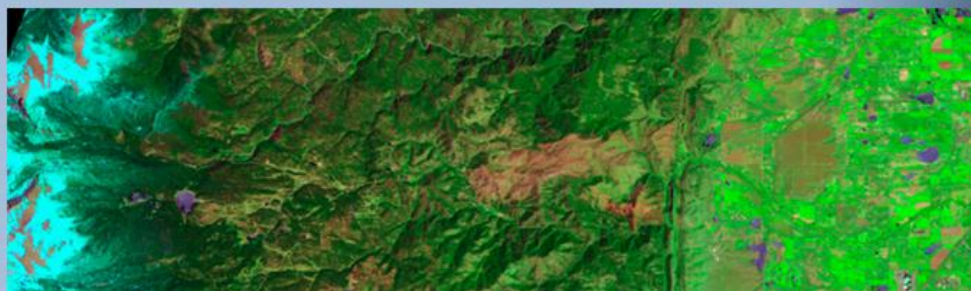
Group On Earth Observations



Federation of Earth Science
Information Partners



earthzine



The Applied Sciences Program's Ecological Forecasting application area was featured in a recent Space News article. [Read More >>](#)

1

2

3

Earth Science Serving Society

The Applied Sciences Program promotes and funds activities to discover and demonstrate innovative uses and practical benefits of NASA Earth science data, scientific knowledge, and technology. The Program's portfolio of projects deliver results in applying NASA Earth science to support improvements in aviation safety, malaria early warning, agricultural productivity, water management, earthquake response, and many other important topics.

The Applied Sciences Program partners with public and private organizations on ways to apply data from NASA's environmental satellites and scientific findings in their decision-making activities and services, helping to improve the quality of life and strengthen the economy.

Applied Sciences Program

News & Events

Applications Areas

Capacity Building

Application Areas



The Program focuses on economic, health, natural resources, and other themes to support both applied research and targeted, decision-support projects in 9 areas of national priority.

Disasters

Ecological Forecasting

Health & Air Quality

Water Resources

Agriculture

Climate

Energy

Oceans

Weather

Performance and Reporting



Applications Readiness Levels



ARLs

9. Approved, Operational Deployment and Use in Decision Making.
8. Application Completed and Qualified.
7. Application Prototype in Partners' Decision Making.
6. Demonstrate in Relevant Environment.
5. Validation in Relevant Environment.
4. Initial Integration and Verification (in Laboratory Environment).
3. Proof of Application Concept.
2. Application Concept .
1. Basic Research.

*Partner
Demonstration
and Transition*

*Development, Test,
and Validation*

*Discovery and
Feasibility*

TRL 9

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TRL 8

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TRL 7

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TRL 6

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TRL 5

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TRL 4

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TRL 3

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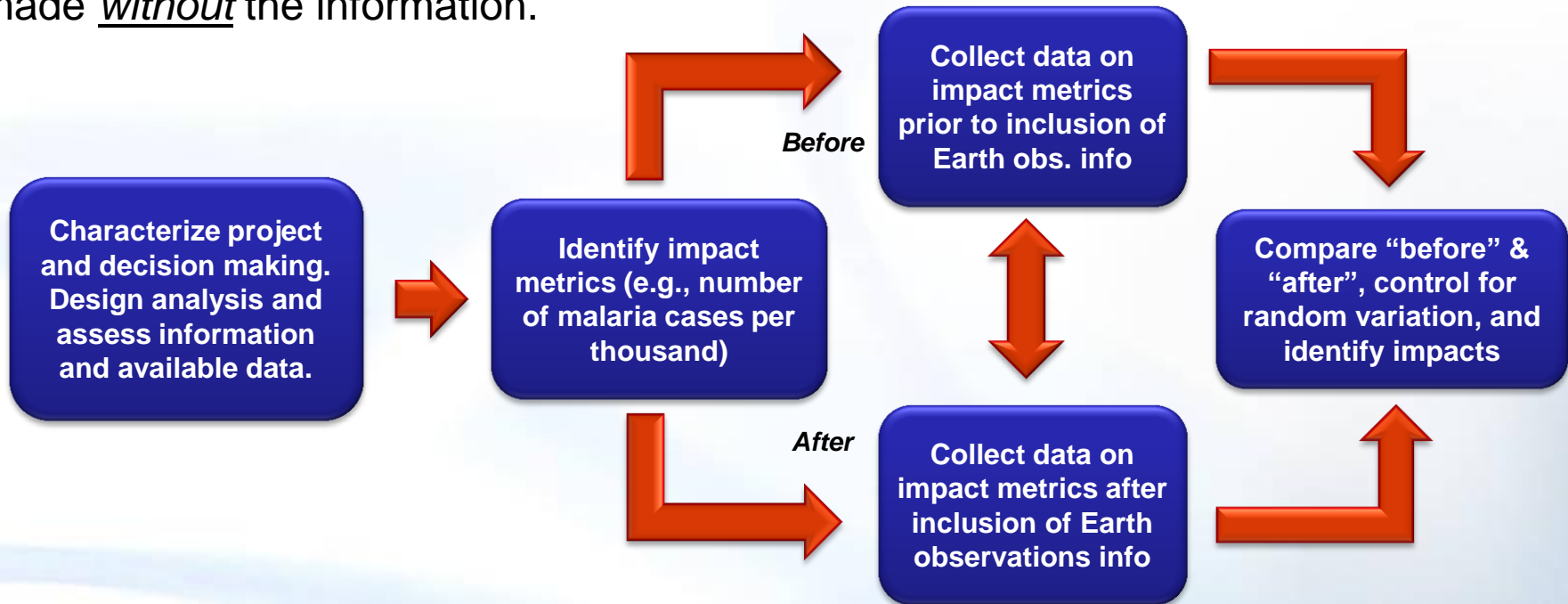
TRL 2

—

TRL 1

General Approach

The analysis used an adapted expected value of information (VI) methodology to assess the benefits. The value of information is a function of the benefits that result from a decision with information compared to the decision that would have been made without the information.



Using this approach, the value of information provided by a project would be:

$$\text{Value of Earth obs. info} = (\text{Outcome with information} - \text{Outcome without information})$$

Cyclic Program Activities – Reports



January						
S	M	T	W	T	F	S
ASP Program Review						
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

July						
S	M	T	W	T	F	S
ASP Program Review						
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

October						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
ASP Annual Report Completed						
26	27	28	29			

May						
S	M	T	W	T	F	S
		1	2	3	4	5
ASP Program Review						
20	21	22	23	24	25	26
27	28	29	30	31		

August						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

November						
S	M	T	W	T	F	S
				1	2	3
ASP Program Review						
18	19	20	21	22	23	24
25	26	27	28	29	30	

March						
S	M	T	W	T	F	S
			1	2	3	
ASP Program Review						
18	19	20	21	22	23	24
25	26	27	28	29	30	31

June						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

September						
S	M	T	W	T	F	S
						1
ASP Program Review						
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

December						
S	M	T	W	T	F	S
						1
ASP Annual Report Content Approved						
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Goals of Project Reporting Guidelines

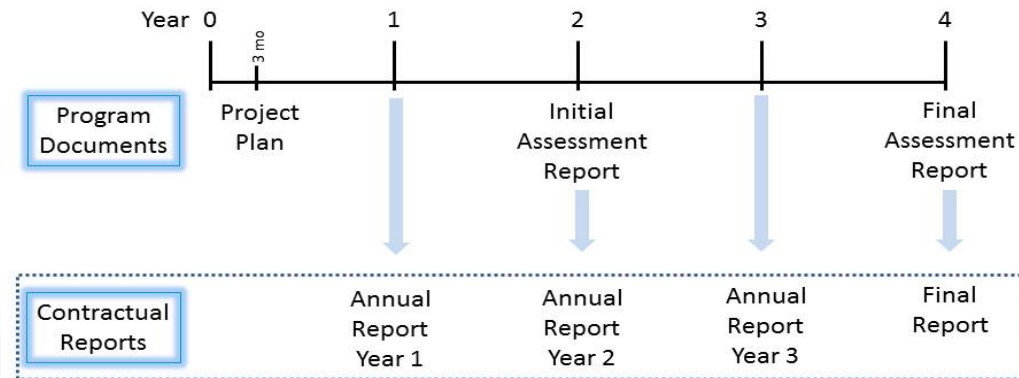


- Project planning
 - Document project products and outcomes
 - Formulate project roles and responsibilities
 - Develop project schedule
 - Outline communications plans within project and with partner
 - Establish project metrics, which address partner needs
 - Baseline project metrics
 - Incorporate Applications Readiness Levels (ARLs) into documentation
 - Prepare for a sustainable transition to the partner/user at end of project
- Project Assessment
 - Communicate project progress to NASA and within project
 - Understand what's working, level of partner satisfaction, obstacles
 - Map ARL progress
 - Track project movement toward transition to the partner
 - Capture lessons learned
 - Provide partner with document translating how project got to this point

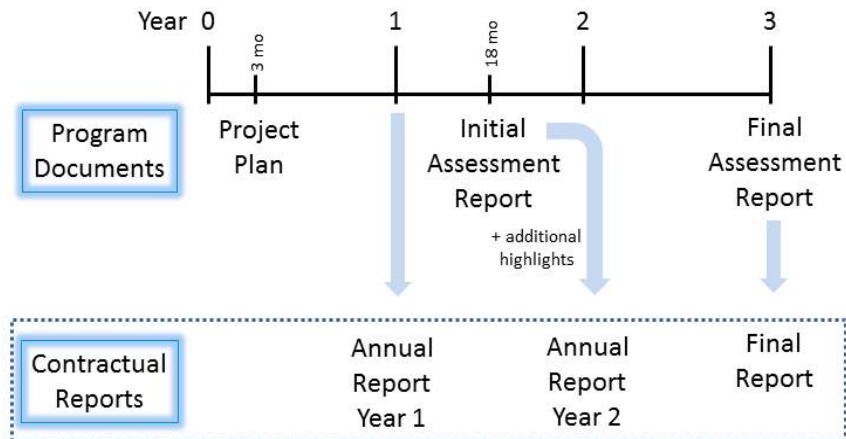
Report Timing



Major Program Milestones + Alignment with Annual Reports (Four-year Awards)



Major Program Milestones + Alignment with Annual Reports (Three-year Awards)



SMD/ESD Applied Sciences Program

Water Resources



Objective/Scope

Discovers and demonstrates applied uses of Earth Observations that address policy and decision processes related to water supply and demand. The Water Resources program funds applied research and applications projects in key functional categories; such as irrigation, flow and flood forecasting, drought monitoring, water quality, snow melt, and climate impacts.

Major partners and end-users:
DOI, NOAA, USACE, DOS, State DWR's,
Local Water Authorities, Intl-NGOs.

Upcoming events:

- ROSES 2012-13 Solicitation
- ROSES 2011 Feas. trans to Dec.



Accomplishments

US Drought Monitor. Project reached milestone to integrate GRACE-based indicators into US Drought Monitor for monthly drought maps used in disaster payments, tax deferrals, etc.

Global Lake/Reservoir Monitor. Developed a system to extract height changes of major in-land reservoirs from radar altimetry measurements from Jason/TOPEX now utilized by USDA, USAID and multiple other agencies including DoD. NASA's SWOT mission will continue effort.

Global Agriculture Monitoring. Enhanced the capability of USDA to monitor global agriculture commodities for US market price discovery by seamlessly integrating NASA earth observation data and science into its process for determining this Principle Federal Economic Indicator.

Key Programmatic Interfaces

Intra-agency.

- Water-Energy Cycle Research
- Missions: SWOT, SMAP, LDCM, GRACE-FO/II

Inter-agency.

- Multiple Federal Agencies
- Western States Water Council/WestFAST
- Surface Water and Water Quality Subcommittee (CENRS)

International.

- USAID
- Agriculture and Water Tasks, Group on Earth Observations
- DOS – Water

Major Issues

- Integrate Deputy Program Application Leads into SMAP, SWOT, and GRACE-FO mission development activities.
- ROSES 2012 Solicitation.
- Project/budget tracking system as well.
- Water Resource challenges rising around the globe.

Historic U.S. Drought in 2012

Global Water Supply-Demand gaps turning in to more and more societal impacts (e.g. food, energy, political strain, ...)

Methods for Communicating Successes, News, and Events



- News Features
- Website
- Newsletters
- Highlights
- Print Materials
- Twitter



National Aeronautics and
Space Administration

Applied Sciences Program

Discovering Innovative & Practical Applications of NASA Earth Science



Water Resources Application Area Review



Questions

